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Dated 1825

An account
of the
Epidemic
of
Lancaster County
Pennsylvania.
by
Carpenter Frazer
of
Pennsylvania.

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An account of the epidemic bilious fever, which prevailed in Lancaster county, Pennsylvania, during the autumns of the years 1820, '21, '22, '23. –

The Summers and Autumns of the first three years, during which this disease prevailed, (those of 1820, '21, '22,), were remarkably arid, dry & sultry. Indeed, three such dry seasons as these were not experienced since the first settling of the country. The year '23 was, however, an exception to the others; instead of being like them very dry, it was a remarkably moist season: the months of July and August were refreshed by enlivening showers; and the country, during the summer of this year, presented a great contrast to those of the three preceding years; in the latter the fields were extremely dry & parched, & no traces of vegetation could be seen; but in the former they were verdant, & vegetation floureished luxuriantly. –

Having premised these remarks on the general state of the weather, during the prevalence of this disease: we shall proceed to the consideration of its remote and exciting causes.

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Of the remote cause.- In the process of the decomposition of all organized bodies, whether animal or vegetable, there is produced by the play of chemical affinities, a peculiar volatile substance, which is held suspended in the atmosphere, and to which is attributed by nearly all the physicians of the present day the property of producing intermittent and remittent fevers. This substance, generated in great quantities, & in a highly concentrated & virulent state, we consider as the remote cause of the disease, which we are to describe in the succeeding pages. It is called miasmata; and it is supposed, that low, moist & marshy grounds, in very warm, sultry & wet seasons, generate it in the greatest quantity and in the most ~~virulent~~ active state. This is proved by the fact, that the inhabitants of low and marshy countries are very subject to the attacks of intermittents and remittents; whilst those, who reside in dry & elevated regions, are entirely free from them, except when there is such a peculiar combination of circumstances, as we shall mention shortly.- This miasma arises from the exposed beds of streams, stagnant water and fresh ploughed

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earth, as well as from the marshy and oozy soils, of which we have spoken.- We also consider, that this effluvium may be generated in dry & elevated situations, when the season is rainy, warm & sultry, and when there are large quantities of decaying vegetable and animal matter lying exposed in them; as is proven by the fact, that the Lancaster county epidemic did prevail in the summer and autumn of '23 in situations, placed under circumstances similar to those mentioned above.

Medical men generally believe, that this miasma is not produced in a state, sufficiently active to prove injurious to the animal frame, unless its production is favoured by moisture, in conjunction with a hot and close atmosphere; that, this state of the weather is conducive to the putrefaction of organic matter, and therefore to the formation of this effluvium, is doubted by no one. But it is a fact well known both to the physicians of Lancaster County and those of the Southern section of the Union, that in warm, dry & close Summers, when the streams are low and their beds exposed to the action of the Sun, this effluvium is generated in immense quantities, and in a condition

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much more virulent and concentrated, than when the season is such, as is generally supposed peculiarly favourable to it. The well known circumstances, that in the Southern States, when the Summers & Autumns are very warm & dry, the autumnal fevers are of a highly malignant character; and that in the hot and unusually dry Summers of 1820, '21, '22, the epidemic assumed a much more severe character, than it did in the following year; incontestably prove the above assertion.-

The action of this effluvium is not confined to the neighboarhood of the spot, in which it is formed; but it may be carried to a considerable distance by the wind, after being mixed with the atmosphere, and still retain the power of affecting the system. The precise distance from the place of its origin, at which it loses this power, is not exactly known: this much, however, we know; that the city of Rome, in the autumn during the prevalence of of the southerly winds, is very subject to intermittent and remittent fevers; which the inhabitants ascribe to the winds, blowing over the extensive Pontine marshes,

and wafting the air, imbued with the marsh miasmata, over the City. And that along the shores of the Delaware, in the commencement of the autumn, when the wind generally blows from the south west, the inhabitants of the western ~~of the cross bars~~ shore of the river will be comparatively free from agues and the other fevers attendant on the season; whilst those of the opposite shore are severely afflicted with them. — These facts, together with a number of others, which it is scarcely necessary to mention, sufficiently prove, that this miasma may be carried to a considerable distance without losing its activity. —

This effluvium, diffused through & contaminating the atmosphere, we consider as the remote cause of this epidemic. Its action is, however, greatly favoured by various circumstances, which have, on this account, received the name of predisposing causes, such as cold, fear, exposure to night air, getting wet, violent exertions & passions of the mind, & finally any thing, which debilitates the system. — These causes put the system in a condition, favourable to the action of the miasma

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and to the production of its specific effect upon it.—

When this disease first made its appearance, and during the two succeeding summers & autumns, it prevailed along the banks of the streams, and in the low grounds; whilst the elevated districts were left entirely free from its visits. This circumstance must have been owing to the extreme dryness and warmth of the seasons, in which the streams & mill-dams were very low, leaving a great part of their beds, exposed to the action of the sun & air; from which immense quantities of miasmata were evolved, affecting the inhabitants in their vicinity.— But in the wet summer & autumn of "23, when the streams were high and every thing presented an appearance quite the contrary to that, which it did in the three preceding years, it prevailed chiefly in the high-grounds, & left the low situations & shores of the creeks almost free from its presence. The reason of this is obvious; namely, that when the creeks & dams were high, & the swamps covered with water, which was constantly renewed, the matter contained in them was covered and not accessible to the action of the sun; therefore, but

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a small quantity of this effluvium could be evolved. In the elevated regions, however, where there was an immense quantity of vegetable matter, exposed both to the sun and air, it was generated in great quantities, and infected the persons inhabiting them.

The disease was generally preceded and followed by affections of the bowels, particularly dysentery, which frequently prevailed at the same time with it. It often assumed the form of a bowel complaint, after continuing for some time, which was always an unfavourable symptom, because it seldom took on that form, untill the system was reduced into a typhoid state; so that the most energetic measures were required to snatch the patient from impending dissolution.

In the commencement of the summer when the disease first made its appearance, it generally put on the form of an intermittent of the quotidian ~~type~~ or tertian type, but most frequently of the latter. if not relieved in the course of three a four weeks, it would then com-

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monly degenerate into a remittent, and that again into a continued ~~form~~ type. But in the months of August & September, when the disease spread over a wide extent of country, it attacked its victims at once in the remittent form: this shape was very violent, almost invariably running its course in nine or eleven days; when the patient either fell a victim to it, or a crisis took place & he gradually recovered.

We shall now proceed to the history of the symptoms & treatment of the disease.—

For three or four days, sometimes for a week previous to an attack, the person affected would have a disinclination to use any exertion, a sense of debility; he would be languid, listless, constantly yawning & stretching, sluggish in his motions; he would have an inclination to be constantly in the sun, his eyes & skin would have a yellow tinge, his tongue would be covered with a white fur, he would have a bad taste in his mouth, & an aversion to food, together with a dull pain in his head, commonly seated immediately over the eyes.

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If the patient, after continuing in this state during the time mentioned, was not attacked by the disease, the symptoms generally wore off gradually in a few days, or he remained in that state state for some weeks; and indeed there were some instances, in which they were affected in this manner during the whole time of the prevalence of the epidemic. When the symptoms did not go off in the manner described; the skin of the sufferer became constricted over the whole surface, as if cold had been applied to it, his features diminished, his lips and nails assumed a livid colour, and his face & extremities became cold & pale. - If the disease put on the intermittent type, the person felt a cold sensation in his extremities, particularly in the lower, extending gradually up to the trunk & from that over the whole body: this was followed by chills and rigors, pains in the bones, as the patient expressed it, pains in the head, joints & in the back, extending down along the spine, by sickness, nausea & generally vomiting of a yellowish, bilious matter; during this stage of the paroxysm, the ideas were

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confused & irregular, and the mind was slightly affected; the pulse was small, quick, frequent & irregular: in this stage the countenance exhibited a peculiar distressed appearance, which forcibly struck every observer. – In this state the patient continued for about an hour, either longer a shorter according to the violence of the attack: then the rigors began to remit, and to alternate ~~the~~ with flushes of heat; at last they left the patient entirely and were succeeded by a sensation of heat over the whole surface, a flushing of the face, redness of the eyes, by an arid rough skin, by violent throbbing of the temporal arteries, by pain in the head and great thirst. When this stage commenced the sickness at the stomach, nausea and vomiting commonly went off, the breathing became less anxious, & more free, but still it was hurried, the pulse became full, voluminous & more regular, but was still frequent, and the fur of the tongue appeared to increase, and assumed a darker hue. – After these symptoms had continued for four, five a six hours, sometimes longer, a slight moisture ~~xxxx~~ ~~bx~~

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became apparent upon the forehead, which gradually extended itself over the body and became a sweat; as this perspiration increased, the symptoms gradually abated, the skin became soft and cool, the pain in the head and the thirst ceased, the respiration by degrees became free and easy, and the pulse assumed its natural standard, but the tongue was still covered with the fur, which was now of a whitish colour. In fine, all the functions ~~all~~ returned to their natural state; but the patient was left in a harrassed, wearied & debilitated condition.—

We have thus attempted to describe the disease, when it appeared as an intermittent. We shall next proceed to its consideration, when it put on the remittent & continued type.—

It was preceded, as in the intermittent, by languor, listlessness, sluggishness, a sense of debility, disinclination to move, pains in the head, back, joints & bones; by anorexia, a continual yawning &c, &c. These were followed by a sensation of chillinesS, & coldness, especially in the extremities, the patient complaining much of cold, whilst the skin exhibited a ten-

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perature above the natural standard; the stomach was affected with nausea & vomiting of a bilious matter in much greater quantities, than in the intermittent, the breathing was anxious & frequent, the pulse was small, quick, frequent & somewhat tense, and the mental functions were slightly disordered. After these symptoms had continued for a short time, flushes of heat came on, alternating with chills, by degrees the chills became less frequent, untill they disappeared altogether; when the face became flushed, the eyes red, inflamed & protuberant, the skin hot & dry; the temporal arteries throbbed violently; the respiration became more full & easy, the pulse also became more full and regular, but still remained quick and frequent, the pains left the back and joints, but that in the head increased, and if the symptoms were very severe, and continued long, delirium generally came on; and the tongue became dry, parched & covered with a fur, which in the commencement of the disease was white with a brown streak in the centre, but as the disease advanced, and

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became more malignant, the fur assumed a brownish and afterwards a blackish hue.— In this state the patient commonly continued for eight or ten hours, when a slight moisture would break out upon the forehead, and extend from that over the surface, which would not be near so copious, nor so generally diffused over the ~~surface~~ body as in the intermittent: as this perspiration increased, the slightly abated, and left the patient partially relieved, but never wholly free from febrile symptoms.— When the fever was mild, this state of remission generally lasted ten or twelve hours; but as it became more severe and malignant, the remissions were shorter and less distinct, untill at length no distinct remission could be perceived, and the disease put on the continued form: when there were no chills or rigors preceding the paroxysm, and the remissions were so slight as scarcely to be discerned.— The remissions commonly took place in the morning and the exacerbations towards evening.— If the disease was mild, a crisis occurred about the

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seventh, ninth or eleventh day, which was indicated by a copious evacuation, either from the skin, kidneys or bowels; that from the kidneys depositing a flaky sediment. From the period of this evacuation the patient rapidly recovered, and soon regained his wonted strength. But in some cases, which were badly treated in their commencement, the disease run on for two or three weeks and sometimes longer without any appearance of a crisis; this form of the disease almost invariably degenerated into a typhoid state, which was characterized by a low, muttering delirium; a dark, black fur, incrusting the teeth, gums & tongue, and by a small, low, weak, frequent & intermitting pulse. To relieve the patient from this state the most energetic measures were required, for, if they were not resorted to promptly he commonly fell a victim in a few days to the epidemic.—

We have now described the causes and symptoms of this disease; and shall next proceed to lay down the plan of treatment, pursued in it.—

The indications, to be attended to in the cure of this disease,

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are these. 1. To free the stomach and alimentary canal of their irritating contents. 2. To keep up a determination to the surface, and excite the action of the cutaneous exhalents. 3. To impart strength and tone to the system.—

To fulfill the first indication an emetic of Specacuanha or tartarized Antimony was generally administered, to evacuate the stomach; and followed by a brisk cathartic, composed of grs. X of Calomel and grs XV a XX of Jalap, or of Cremor tartar & Jalap in the proportion of grs XXV of the former to grs. XX of the latter. Instead of the emetic alone in the first place, an emeto-cathartic was frequently given, which was attended with greater success, than first method; the prescription, employed for this purpose, was of Calomel grs. V. & Specac. grs. XX. It vacuated the stomach thoroughly, which relieved it of the great distress and nausea, under which it laboured, and cleared the bowels of the redundant bile and faculant matter, which irritated their internal coat.

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ly evacuated, sudorifics were resorted to with with great success. When a gentle and universal diaphoresis had been kept up for a day a two, an intermission commonly took place: if, however, this perspiration was obtained by stimulating & heating measures, it produced injurious, instead of beneficial results.- To excite this diaphoresis various means were had recourse to. To this purpose the pulvis ipecacuanha compositum was employed with great advantage, especially if united with a very small proportion of calomel. The antimonial powders, composed of nitrate of potash grs. VIII, of tartarized antimony one eighth of a grain, and of calomel grs, were found to be very serviceable, given in the proportion mentioned every two a three hours; the calomel was exhibited, untill the gums became slightly affected, and then discontinued; when this took place, the disease was generally found to be broken and an intermission was gained for the admission of the bark.- Specacuanha, exhibited in small doses, proved a very serviceable diaphoretic; so did Tartarized antimony, exhibited as in the following formula; ℞. Tart. antim. grs ii, aqua ℥ii. of this

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solution a tea-spoonful was given every hour or two, which seldom failed to produce a copious diaphoresis. These, together with the James powder occasionally, were the chief remedies, made use of to fulfill the second indication. - In the meantime however, the bowels were kept open with gentle laxatives; such as the Castor oil, the Neutral salts, or Senna & manna &c. - In this disease, the state of the bowels had to be particularly attended to: for, if they were irritated with much excrementitious matter, the symptoms would be greatly aggravated.

If, however, in spite of all our endeavours, the patient declined, and was sinking into a typhoid state, the evacuating plan had to be abandoned, and stimulants freely exhibited. If the patient had not sunk, these medicines, given in small quantities, would quickly relieve him: but if he was so weak & debilitated, that the pulse was very frequent, & so low and weak as scarcely to be perceptible, and if this was attended

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with a low muttering delirium; then blisters were applied to the head and extremities, and the most powerful and diffusive stimulants were resorted to, to sustain and raise his sinking energies. Wine, Brandy, the carbonate of ammonia, Musk & camphor were the medicines, chiefly used for attaining this end. The wine was exhibited in as large quantities, as the patient could bear; and prepared with his food in the shape of wine whey. The camphor was found to be very much improved by adding a small portion of nitre and calomel to each dose, leaving off the calomel as soon as the mouth became slightly affected. When these measures were used with promptitude & vigor, the patient commonly recovered.

When an intermission was obtained by the means, mentioned above, the Cinchona was administered to give tone to the system. It was found to be the most valuable medicine for that purpose: exhibited in large doses, frequently repeated, during the intermission, it was found to possess great activity, and commonly cut short the disease. - The sulphat

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of Quinine was tried in a few cases only, that we know of; therefore we cannot speak conclusively of its virtues; but if we were allowed to form an opinion from the result of the few cases, in which it was tried, we should pronounce it to be superior to the bark itself. - If the bark could not be taken in substance, it was given in decoction, rendered palatable by the addition of a little cinnamon & cloves. If it failed alone, it was then combined either with the radix serpentaria, & some of the preparations of iron. Fowler's solution of arsenic was employed with great success, whenever the bark failed. After the disease was removed, the patient, who was left in a weak & debilitated state, soon recovered his wonted strength by the use of a generous diet, cool, pure air, and gentle exercise.

This was the plan of treatment, pursued in the cure of the remittent form of the disease; and when employed in time and with judgment, it seldom failed to effect a cure.

In the intermittent, the treatment was usually commenced with the exhibition of an emeto-cathartic, & an emetic follow-

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ed by a cathartic: after the stomach and bowels were evacuated, the cinchona was given in large doses during the intermission; this commonly accomplished the cure of the patient in a few days. Some cases, however, were very obstinate, & withstood all the powers of the bark: in such the liquor arsenicalis was usually employed successfully. A large dose of opium, exhibited in the commencement of the cold stage, or immediately before it accession, greatly lessened the duration and violence of the paroxysm. - I saw the prussiate of iron used in a few cases as a substitute for the bark, the result of which was favourable.-

The circumstance, that this disease would not bear any copious evacuation, distinguished it from the autumnal fevers of any of the preceding years. Venesection could not be carried to any extent, without giving rise to the most dangerous consequences; reducing the patient so low, that it required the free use of the most active stimulants to raise him: indeed, if a large amount of blood was detracted, he generally sunk down into a typhoid state,

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from which he seldom recovered. Even after the operation of the first cathartic a copious and powerful evacuation of the bowels was dangerous: in this case the gentle cathartics were the proper remedies.—

We have now completed the account of this epidemic, which we have delineated, as it appeared to ourselves and the physicians, with whom we are acquainted. —

Doctor Physick